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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,863	07/15/2003	Niranjan Thirukkavalur	200208989-1	9129

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EXAMINER

RUTHKOSKY, MARK

ART UNIT PAPER NUMBER

1745

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/620,863

Applicant(s)

THIRUKKOVALUR ET AL.

Examiner

Mark Ruthkosky

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 8-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/15/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement filed 7/15/2003 has been placed in the application file, and the information referred to therein has been considered as to the merits.

### ***Drawings***

The drawings filed on 8/23/2004 have been approved.

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-7, in the reply filed on 5/15/2006, is acknowledged.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanjo et al. (JP 2001-052,727.)

The instant claims are to a fuel cell system, comprising: at least first and second fuel cells, each of the fuel cells having at least one reactant inlet line and at least one output outlet;

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and a first heater arrangement operably connected to the at least one output outlet of the first fuel cell and associated with the at least one reactant inlet line of the second fuel cell such that heat from the first heater arrangement is transferred to reactants in the at least one reactant inlet line of the second fuel cell.

Nanjo et al. (JP 2001-052,727) teaches a fuel cell system comprising a fuel cell having at least one reactant inlet line and at least one output outlet, and a first and second heater arrangement operably connected to the at least one output outlet of the fuel cell and associated with the at least one reactant inlet line of the fuel cell, such that heat from the heater arrangement is transferred to reactants in the at least one reactant inlet line of the fuel cell (see the abstract.) Heaters are disclosed at the fuel and oxidant inlets of the fuel cell (see the figures, including figure 1 and the corresponding text.) Additional reactant sources are located downstream from the heater at an inlet valve arrangement as taught in figure 4. The reactant lines include recycling valves for exhaust flow to a burner and to a valve in the oxidant inlet line upstream from the heater (figures 1-4.)

Nanjo et al. (JP 2001-052,727) does not teach a fuel cell system comprising at least first and second fuel cells, wherein a heater arrangement is operably connected to the at least one output outlet of the first fuel cell and associated with the at least one reactant inlet line of the second fuel cell such that heat from the first heater arrangement is transferred to reactants in the at least one reactant inlet line of the second fuel cell. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the heating process of Nanjo et al. (JP 2001-052,727), which teaches using the exhaust of a fuel cell to heat the reactant at the inlet of the same fuel cell, to heat the reactants of another fuel cell. Preheating the

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reactants for the fuel cell provides improved generating efficiency and use effectiveness of the fuel cell (paragraph 7.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat an identical fuel cell using the methodology taught in Nanjo et al. (JP 2001-052,727,), as it will heat the fuel cell reactants in an equivalent manner. With regard to claim 4, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the heating process of Nanjo et al. (JP 2001-052,727), which teaches using the exhaust of a fuel cell to heat the reactant at the inlet of the same fuel cell, to heat the reactants of multiple fuel cells, as preheating the reactants provides improved generating efficiency and use effectiveness of the fuel cell, as previously noted, (see paragraph 7.) The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

#### ***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745

MARK RUTHKOSKY  
PRIMARY EXAMINER

*Mark Ruthkosky*  
7/21/2006